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Fact Sheet

Swine Housing

AFS-3-8-10

United States Department of Agriculture

Office of Governmental and Public Affairs

Space Requirements for Swine

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The space requirement per pig reared on dirt lots or pasture has previously been given little special attention. However, as confinement production developed, the amount of space needed per pig for optimal performance became an important planning-management consideration. This fact sheet deals with space management in confinement production.

Table 1. Space recommendations for pigs using partial or total slats.

Pig weight or class	Sq. ft. for partial or total slats
15-30 lb.	1.7-2.5
30-60 lb.	3-4
60-100 lb.	5
100-150 lb.	6
150-market	8*
Gestating sows or gilts	14-16
Boars (developing)	20
Boars (mature)	40

*Adjusting pig numbers per pen seasonally may result in improved performance. For example, increasing the number per pen by 1 or 2 pigs during winter may be desirable.

Table 2. Space requirement recommendations for pigs using building with outside apron.

Pig class	Sq. ft.
Growing-Finishing	6 sq. ft. inside plus 6 sq. ft. outside
Sows	11-12 sq. ft. inside plus 11-12 sq. ft. outside
Boars	40 sq. ft. inside plus 40 sq. ft. outside

General Space Management

Too few pigs per pen reduces the return on initial building investment. However, care must be taken to prevent overcrowding. The results of overcrowding may include tail biting or cannibalism, reduced gain, increased feed required/unit gain, gastric ulcers and/or additive stress factors. Various levels of these, plus others, may cause increased susceptibility to disease or other adverse effects on performance or reproduction.

It is generally impractical to provide the optimal area per pig at all stages of the life cycle. Since, for most phases of life, the pig is continuously increasing in size, the space requirement changes at a similar rate. Movement of pigs from one building to another to provide optimal space has, in at least one study, caused setback in pig performance and health. Moving pigs to larger pens to adjust for increased size may be best accomplished when the move is within a building rather than between buildings, especially for young pigs. For most producers, providing optimal space must be a manageable compromise between adjusting the pen size and/or the number of pigs per pen. Maximizing pen occupancy is perhaps best achieved by utilizing pens of increasing size. Mixing groups of pigs is a somewhat risky method of obtaining optimum occupancy.

Tables 1-3 give space recommendations based upon current research that take into account most factors. (Space recommendations may vary slightly between sources.)

Table 3. Space requirement recommendations for pigs using pasture and shade space.

Pig class	Pasture	Shade or winter housing
Sows	10 sows/acre	15-20 sq ft./sow
Sows and litters	7 sows and litters	20-30 sq. ft./sow and litter
Boars	1/4 acre/boar	40-60 sq. ft./boar

Issued in furtherance of Cooperative Extension Work in Agriculture and Home Economics (Acts of Congress of May 8 and June 30, 1914), in cooperation with the U.S. Department of Agriculture, Office of Governmental and Public Affairs, Washington, D.C. 20250, and Department of Animal Sciences, Purdue University, West Lafayette, Indiana 47907. This publication was prepared by Purdue University. It is the policy of the U.S. Department of Agriculture that all persons shall have equal opportunity and access to its programs and facilities without regard to race, religion, color, sex or national origin.

Space requirements for flat-decks and battery cages have not been well established. However, generally these types of weaning facilities are stocked at a rate of 1.5-2.0 sq. ft. per pig to a terminal weight of about 35-40 lb. Apparently, the higher stocking density is functional due to the smaller size group characteristic of this system, as compared to a conventional nursery.

Space Management on Solid Floors

With solid floors, bedding of some type should be used, at least during winter or seasonally with small pigs. Since most floors have about ½ in. slope per foot, the bedding often becomes scattered and does little good. Many producers have found it practical to use a "bedding board" to hold the bedding in place (Fig. 1). Generally, the bedding board will be a 2 in. x 6 in. or 8 in. board secured on edge and placed initially far enough from the back of the pen to give the pigs only as much space as needed to rest comfortably. As the pigs grow, the bedding board should be moved outward in increments of about 2 ft. This not only holds the bedding in place, but trains the pigs to step over the bedding board to dung and urinate, thereby preserving the bedding and reducing labor. A 3 ft. high movable solid panel with a small door off to one side is similar to the bedding board and is equally effective.

A variation of the bedding board is the crowding panel (Fig. 2). It differs from the bedding board in that the pigs are usually crowded to the front of the pen initially with the panel being moved back in increments of approximately 2 ft. as more space is needed. The crowding panel is usually solid rather than mesh so that air movement or drafts are reduced.

This system has the advantage of not allowing any unnecessary pig traffic into most of the pen when the pigs are small. This prevents indiscriminate messing in nonessential space, thereby reducing labor and preserving bedding. A disadvantage of the crowd panel is that in some systems the pigs will be crowded to the open side of the building or toward a door. Since the pigs will usually be small when the panel is used, crowding toward an opening during cold periods may result in more severe pig health or reduced performance problems.

There are variations of the bedding board and crowd panel other than those illustrated. The point intended is that management techniques can reduce labor and bedding wastage with solid floor systems and can result in more profit from the enterprise.

Space Management on Partial or Totally Slotted Floors

For some systems with slotted floors, crowding panels may be utilized to adjust space needs. However, since a crowding panel in this type of system dictates feeder and waterer location without regard for other management considerations, it is not used widely. Most producers who adjust pen size or move pigs during the growing-finishing period find it practical to make one move or adjustment for a particular group of pigs. Frequency of farrowing may be a factor in deciding how often the pigs should be moved. Greater farrowing frequency usually results in, or justifies, more frequent pig movement in the growing-finishing barns to adjust for space needs. Movement of pigs should not include mixing of pigs from two or more pens, as fighting and frequently death loss result. Examples of schemes using a one-move growing-finishing system are shown in Fig. 3.

In scheme 1, the 6 ft. wide pens would house about 28 pigs per pen to an average weight of approximately 100 lb. At that weight, they will have "outgrown" the smaller starter-growing pens and will be moved to the larger finishing pens. This will free the smaller pens for repopulation. A disadvantage of this scheme and variations of it is that from a pig health viewpoint there are usually older pigs in the building when younger and more susceptible pigs are brought in. Consequently, strict within-pen sanitation, including washing and disinfecting, should still be practiced before new pigs are brought into the empty pens.

Growing-finishing buildings with an off-center alley allow the producer simply to move the pigs across the alley as they outgrow the smaller pens.

A disadvantage of scheme 2 is that the nursery-growing pens are more square than one might ideally design them. A more rectangular pen may encourage better dunging patterns. In this case, totally slotted pens are often recommended to eliminate the concern about dunging problems. Even so, this arrangement may be considered practical and will allow for greater economy of space utilization than if the pens were all the same size. The same sanitation-disinfecting situation is true for this scheme as for scheme 1.

There are other schemes that attempt to enhance economy of space utilization. Most are very specific for the particular manager involved, and their success is more a function of management than of any mechanical feature. The system that puts 30-40 lb. pigs in a pen, allowing 8 sq. ft. per pig and leaving them until market weight, is common even though the pig initially has about twice as much space as it needs during the growing period. Some producers feel simplicity and ease of management partially compensate for the somewhat inefficient space utilization in this system.

Number Per Pen

Pen size, and thus number of pigs per pen, varies depending on management goals and understanding or interpretation of requirements and recommendations. Family units or litters penned individually perform very well in comparison to larger groups. However, the number of pigs per pen, on a practical basis, usually reflects a compromise between equipment and pig numbers. Again, management is perhaps as important as numbers. As number of pigs per pen increases, the within-pen competition increases, and this may result in reduced performance. As long as the pigs have the recommended area per pig, and the correct feeder space and watering sources, the number of pigs per pen may be less important. However, research and practical field experience show that the compromise between equipment and growing-finishing pig numbers per pen is somewhere between 20 and 30 pigs in totally enclosed, as well as modified open front, housing. For buildings with outside aprons or dirt lots, larger groups are practical as long as the requirements for feeders, waterers and sleeping area are met.

Seasonal Effect on Space

Since, as part of his thermal regulatory mechanism, a pig can, in a manner of speaking, make himself smaller when he is cold and larger when he is warm, management should recognize this ability. For example, during cold weather or winter, allowing 1 or 2 more pigs per pen, and during warm weather, or summer, allowing 1 or 2 fewer pigs per pen, may result in better performance, improved management or both.

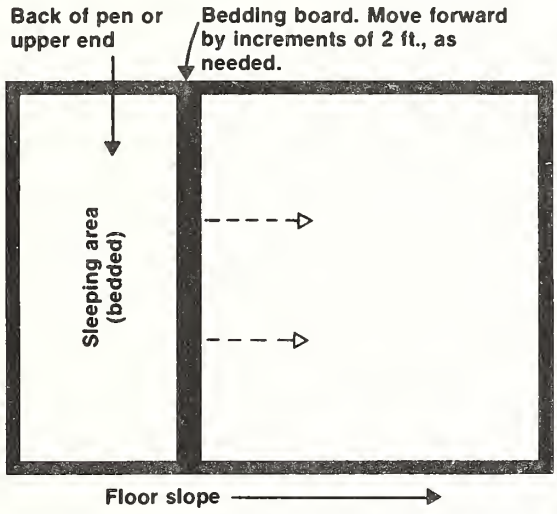

Figure 1. Scheme showing how a bedding board is used to contain bedding and to toilet train pigs.

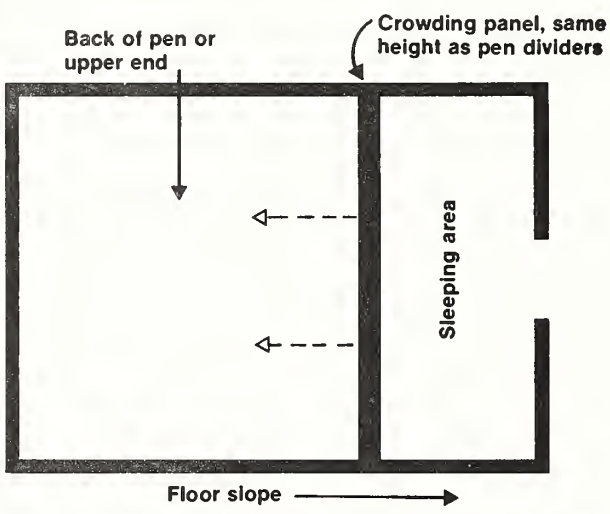

Figure 2. Scheme showing the general layout for a crowding panel as a management tool.

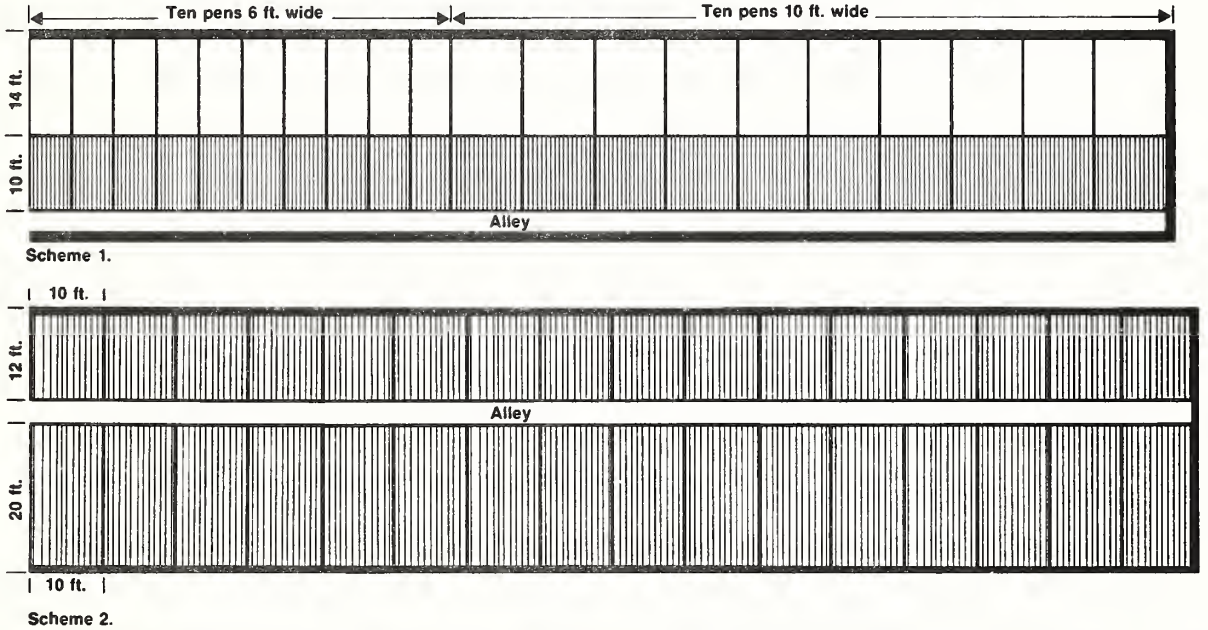

Figure 3. Two schemes showing floor arrangements that utilize space more efficiently than buildings with pens all the same size.

Issued March 1981

☆U.S. Government Printing Office: 1981—340-939/102